DOCUMENT RESUME

ED 447 522 CS 510 435

AUTHOR Mottet, Timothy P.; Beebe, Steven A.
TITLE Emotional Contagion in the Classroom: An Examination of How Teacher and Student Emotions Are Related.
PUB DATE 2000-11-00
NOTE 36p.; Paper presented at the Annual Meeting of the National Communication Association (86th, Seattle, WA, November 9-12, 2000).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Arousal Patterns; Communication Research; *Emotional Response; Higher Education; *Nonverbal Communication; *Student Behavior; *Teacher Behavior

ABSTRACT

The purpose of this study was to examine emotional contagion in the classroom. The theory of emotional contagion predicts that people automatically mimic and synchronize expressions, vocalizations, postures, and movements with others and consequently converge emotionally as a result of the activation and/or feedback from such mimicry (Hatfield, Cacioppo, & Rapson, 1992). Subjects were 465 students enrolled in an introductory communications course at a university in the southwestern United States. It was hypothesized that (1) teacher and student nonverbal behaviors in the classroom will be related; (2) as students' nonverbal behaviors increase, so will their emotional response; and (3) student and teacher emotional responses will be related. All three hypotheses were supported. Providing additional support for the theory was the fact that students' nonverbal behaviors were more predictive of their emotional response than their teachers' nonverbal behaviors. (Contains 51 references, and 4 tables and a figure of data.) (RS)

Reproductions supplied by EDRS are the best that can be made
from the original document.

Running head: EMOTIONAL CONTAGION IN THE CLASSROOM

ED 447 522

Emotional Contagion in the Classroom: An Examination of How Teacher and Student Emotions are Related

Timothy P. Mottet Steven A. Beebe

Southwest Texas State University

U.S. DEPARTMENT OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

T. Mottet

Timothy P. Mottet (Ed.D., West Virginia University, 1998) is Assistant Professor and Basic Course Director and Steven A. Beebe (Ph.D., University of Missouri, 1976) is Professor and Chair of the Department of Speech Communication at Southwest Texas State University, 601 University Drive, San Marcos, Texas 78666-4616. Direct comments regarding this paper to the first author at 512-245-3139, fax at 512-245-3138, or tm15@swt.edu. This paper will be presented at the annual conference of the National Communication Association in Seattle, WA. The authors would like to thank Melanie Booth-Butterfield for a preliminary review of this manuscript.

CS 510 435

BEST COPY AVAILABLE

Abstract

The purpose of this study was to examine emotional contagion in the classroom. The theory of emotional contagion predicts that people automatically mimic and synchronize expressions, vocalizations, postures, and movements with others and consequently converge emotionally as a result of the activation and/or feedback from such mimicry (Hatfield, Cacioppo, & Rapson, 1992). It was hypothesized that (1) teacher and student nonverbal behaviors in the classroom will be related, (2) as students' nonverbal behaviors increase, so will their emotional response, and (3) student and teacher emotional responses will be related. All three hypotheses were supported. Providing additional support for the theory was the fact that students' nonverbal behaviors were more predictive of their emotional response than their teachers' nonverbal behaviors.

Emotional Contagion in the Classroom: An Examination of How Teacher and Student Emotions are Related

Emotions have long been recognized as a key variable of human communication. Since Aristotle identified pathos as one of the primary means of influencing others, scholars have sought to identify the effect of emotions on human behavior. In addition to emotion being the central focus of two recent books examining communication and emotion (Andersen & Guerrero, 1998; Planalp, 1999), researchers have also examined emotion as a variable in persuasive message processing (Mitchell, 2000), compliance-gaining message selection (Vinson & Biggers, 1993), message influence in close relationships (Dillard, Kinney, & Cruz, 1996), display rule development in romantic relationships (Aune, Buller, & Aune, 1996), intercultural training of international teaching assistantships (Yook & Albert, 1999), and as information in communication production (Booth-Butterfield & Booth-Butterfield, 1998).

In the instructional context, numerous studies have examined emotion-related variables such as immediacy (Andersen, 1979; McCroskey & Richmond, 1992), affinity seeking (Frymier & Thompson, 1992; McCroskey & McCroskey, 1986), and motivation (Christophel, 1990; Frymier, 1994). Although few and varied theoretical explanations have been offered to explain the effectiveness of these variables (Kelley & Gorham, 1988; Richmond, 1990; Rodriguez, Plax, & Kearney, 1996), a comprehensive theoretical framework explaining the predictive nature of these variables has yet to emerge from the research literature.

The purpose of this study was to examine the role of emotions in the instructional context. The theory of emotional contagion suggests that all participants in a

communicative exchange are susceptible to each other's emotions and the contagion effect (Hatfield, Cacioppo, & Rapson, 1994). This study examined whether or not students "caught" their teachers' emotions and if so, how did this contagion occur? In order to explore these questions, three domains of literature were reviewed: emotion and communication, emotional contagion theory, and emotional contagion theory and instruction.

Literature Review

Emotion and Communication

Understanding the relationships between emotion and communication remain important for several reasons. First, many researchers believe that emotion is central to all human interaction (Dillard, 1998; Planalp, 1999). In discussing the role of emotion in communication, Dillard (1998) articulated three nonexclusive perspectives: emotion motivated communication, emotion-manifesting communication, and emotion-inducing communication. Verbal and nonverbal messages driven by anger are examples of emotion-motivated communication. Communication is emotion-manifesting when a person's communication expresses his/her internal state such as "I'm feeling happy today." Finally, communication can be emotion-inducing. This occurs when one person stimulates an emotional response in the other. According to Dillard, these three perspectives are to a degree part of any social interaction.

The second reason for investigating the relationship between emotion and communication is because emotional response has been shown to consistently influence behavior (Cacioppo & Gardner, 1999; Russell & Mehrabian, 1978). In a review of literature, Biggers and Rankis (1983) reported that emotion accounted for a large

percentage (40% or more) of variance in research studies predicting behavior. In the instructional context, students may use their emotions as information to guide what Hatfield, Cacioppo, and Rapson (1994) referred to as bivalent (approach/withdrawal) behavior. Similarly, Dillard (1998) reported that the primary function of affect or emotion is to guide approach and withdrawal forms of behavior.

In explaining the relationship between emotion and communication, Mehrabian (1981) argued that implicit communication or expression that involves nonverbal messages, plays the predominant role in affecting emotional response. Mehrabian defined implicit communication as "aspects of speech [that] are not dictated by correct grammar, but are rather expressions of feelings and attitudes above and beyond the contexts conveyed by speech" (p. 2).

In the instructional context, Mehrabian's (1971) immediacy construct has been studied extensively (McCroskey & Richmond, 1992). In the classroom, teachers who are perceived to be immediate (i.e., forward body leans, direct eye contact, purposeful gestures) are also perceived to be approachable and likeable. The implicit message is one of approach rather than avoidance. Similarly, students' nonverbal responsiveness, a construct indicative of immediacy, has been shown to be positively related to teachers' impressions of students, and positively related to perceptions of their teaching effectiveness and satisfaction (Mottet, 2000). Through their nonverbal messages, students send implicit messages to their instructors about how they feel about the course and the instructor.

Having discussed some of the relationships between emotion and communication, the review will now shift to how emotion is conceptualized and measured, which remains

problematic for many researchers (For an extended review of these issues, reference Cacioppo & Gardner, 1999; Guerrero, Andersen, & Trost, 1998; and Russell & Barrett, 1999). The first part of this review examines conceptualization issues, and the second part examines emotional response measurement.

Conceptualizing emotions. Planalp (1999) argued that although researchers disagree about the specific components comprising emotion, five components appear in most theoretical discussions: (1) objects, causes, precipitating events, (2) appraisal, (3) physiological changes, (4) action tendencies/action/expression, and (5) regulation.

Russell and Barrett (1999) suggested that the term "emotion is too broad a class of events to be a single scientific category" (p. 805) and make the important distinction between prototypical emotional episodes and core affect. According to Russell and Barrett, a prototypical emotional episode is a "complex process that unfolds over time, involves casually connected subevents (antecedent; appraisal; physiological, affective, and cognitive changes; behavioral response; self-categorization), has one perceived cause, and is rare" (p. 805). Being afraid of, angry with, or in love with or all examples of prototypical emotional episodes.

Core affect "refers to the most elementary consciously accessible affective feelings that need not be directed at anything" (Russell & Barrett, 1999, p. 806). Examples of core affect include pleasure/displeasure and tension/relaxation. Although Russell and Barrett (1999) referred to core affect as free-floating and not specifically directed at anything, it can become directed as it does when part of an emotional episode. They also considered core affect to be a fundamental component of an emotional episode.

Based on their research, core affect and emotional episodes are related and overlap, but are not the same thing.

Concurrent with Russell and Barrett (1999), Guerrero, Andersen, and Trost (1998) suggested that "affect refers to the general valence of an emotional state, whereas emotion refers to specific types or clusters of feelings that occur in response to particular events" (p. 5). Hatfield, Cacioppo, and Rapson (1994) differentiated emotion from attention and memory by stating that, "minimally, emotional stimuli (1) are categorized as being either positive or negative, and (2) predispose people to bivalent behavior (approach/withdrawal) toward the stimuli" (p. 3).

Measuring emotions. According to Russell and Barrett (1999), researchers examining emotions must first decide if they are measuring prototypical emotional episodes or core affect, since their structures are different. In this study, core affective response was measured rather than emotional episodes. The argument for this distinction is made in subsequent paragraphs where Hatfield et al. (1994) clarify the differences between emotional contagion and "primitive" emotional contagion.

After explaining how people experience core affect and how they report that experience, Russell and Barrett (1999) argued for a factorial approach to measuring core affective responses. This model remains consistent with that used by Mehrabian and Russell (1974), which has also found considerable support among communication researchers (Beebe & Biggers, 1986; Biggers & Masterson, 1983, 1984; Biggers & Pryor, 1982; Biggers & Rankis, 1983; Christ & Biggers, 1984; Vinson & Biggers, 1993). The method consists of three dimensions: pleasure-displeasure, arousal-non arousal, and dominance-submissiveness. Each dimension is of a continuous nature and has within its

range positive and negative values as well as a neutral point. Combinations of various values on each of the pleasure, arousal, and dominance continua characterize different emotional responses.

Pleasure. Adjective pairs like happy-unhappy, pleased-annoyed, or satisfied-unsatisfied define the pleasure-displeasure dimension. "Pleasure, at the level of subjective experience, summarizes how well one is doing" (Russell & Barrett, 1999, p. 809). Psychological indication of this dimension is the presence or absence of a longing to approach the subject or object. Generally, stimuli that produce greater pleasure elicit greater liking (Mehrabian, 1981).

Arousal. The arousal-non arousal or activation dimension is defined by adjective pairs: stimulated-relaxed, excited-calm, or frenzied-sluggish. "Activation, at the level of subjective experience, refers to a sense of mobilization or energy" (Russell & Barrett, 1999, p. 809). Psychological indication of this dimension is mental alertness. Behavioral indications for this dimension are physical activity levels (Mehrabian, 1980). The arousal dimension modifies emotional reactions to stimuli by exaggerating the reaction of liking or disliking.

Dominance. The dominance-submissiveness dimension is defined by adjective pairs such as bold-meek, domineering-helpless, or powerful-powerless. Psychological indications of this dimension are feelings of power and control (Mehrabian, 1981). Behavioral indications for this dimension are found in a relaxed posture, body lean, reclining angle while seated, or asymmetrical position of the limbs (Mehrabian, 1980). Generally, emotions of greater dominance result in feelings of greater empowerment. Alternately, emotions of submissiveness result in decreased license to acknowledge

liking or disliking (Mehrabian, 1981).

Although not the focus of this research study, it has been theorized that students, who experience an increase in pleasure, arousal, and dominance, are going to experience positive affect for their educational experience and will ultimately do better as students. Thus, the emotional response of students may help explain and predict student learning. Given the importance of emotions to human communication and their potential influence in the classroom, researchers have examined the process of how emotions are expressed and "caught" between people resulting in emotional contagion.

Theory of Emotional Contagion

The theory of emotional contagion (Hatfield, Cacioppo, & Rapson, 1992) explains and predicts what people have intuitively known for years, that people can "catch" each other's emotions. Important to this study, in terms of its methodology, is the distinction Hatfield et al. (1994) made between emotional contagion and "primitive" emotional contagion with the former encompassing prototypical emotional episodes and the later encompassing core affect. They considered emotional contagion to consist of a family of multi-level phenomenon. "The precipitating stimuli arise from one individual, act upon one or more other individuals, and yield corresponding or complementary emotions in these individuals" (p. 5).

Hatfield et al. (1994) considered primitive emotional contagion, which is the focus of this study, to be "that which is relatively automatic, unintentional, uncontrollable, and largely inaccessible to conversant awareness" (p. 5). Specifically, primitive emotional contagion is defined as "the tendency to automatically mimic and synchronize expressions, vocalizations, postures, and movements with those of another

person's and, consequently, to converge emotionally" (Hatfield et al., 1992, pp. 153-154). The theory of emotional contagion contains three propositions:

(1) In conversations, people tend automatically and continuously to mimic and synchronize their movements with facial expressions, voices, postures, movements, and instrumental behaviors of others.

(2) Subjective emotional experiences are affected, moment to moment, by the activation and/or feedback from such mimicry.

(3) Given propositions 1 and 2, people tend to "catch" others' emotions, moment to moment.

The following paragraphs review the research literature that supports each of the preceding propositions including mimicry/synchrony, emotional experience and feedback, and the emotional contagion effect.

Mimicry/synchrony. According to Burgoon, Stern, and Dillman (1995), "[m]otor mimicry refers to the tendency to imitate others' nonverbal expressions, particularly expressions such as laughter, pleasure, embarrassment, pain, discomfort, and physical exertion" (pp. 25-26). Researchers have documented that people automatically mimic and synchronize their facial, vocal, and postural movements with others with startling rapidity (Burgoon, Stern, & Dillman, 1995; Hatfield, Cacioppo, & Rapson, 1994). This rapid mimicry cultivates a convergence of emotions among interactants[1]. The mechanism that causes the convergence of emotions is referred to as "afferent feedback" or the feedback one receives from mimicking the behavior of others.

Emotional experience and feedback. Researchers have found considerable evidence that suggests that emotional experience and somatic or physical bodily

expressions are tightly linked (Hatfield et al., 1994). The facial, vocal, and postural feedback hypotheses support the proposition that afferent feedback from mimicry affects emotions. The facial feedback hypothesis asserts that expressions registered first by the face feed back to the nervous system and elicit the emotional experience (Cappella, 1993: Laird, 1974). Feedback from the voice (Hatfield, Hsee, Costello, Schalenhamp, & Denney, 1995; Siegman, Anderson, & Berger, 1990) and posture (Bull, 1951; Duclos, Laird, Schneider, Sexter, Stern, & Van Lighten, 1989) have also been shown to affect emotional experience.

Emotional contagion effect. Given the support for mimicry and synchrony of social interactions (Hatfield, Cacioppo, & Rapson, 1994; Burgoon, Stern, & Dillman, 1995) and the relationship between emotional experience and the physical expression of an emotion, Hatfield et al. (1994) argued that emotions are contagious. That is, emotions expressed by one individual will likely be experienced and subsequently expressed by another person who is engaged in social interaction.

Emotional Contagion and Instruction

The theory of emotional contagion, if supported in the instructional context, may have important implications for the classroom. First, understanding the power and pervasiveness of emotional contagion might help instructors to correctly assess factors that shape classroom social interactions, which would allow them to manage better those interactions. For example, Behnke, Sawyer, and King (1994) found empirical support for the theory in terms of anxious public speaking students who infected others on the day of their oral presentations.

Second, instructors need to learn how to engender positive emotions so that students will approach rather than avoid the instructor, course content, and classroom. Similarly, instructors need to learn what negative emotions they should mask in order to prevent contagion that might repel students from them, their content, and their classrooms. Both of these applications remain important especially since emotions have been linked to learning outcomes (Mayer, 1986; Salovey & Sluyter, 1997). Finally, instructors need to learn how to inoculate themselves from their students' negative emotions in order to prevent contagion that might become detrimental to their teaching effectiveness and classroom interaction.

The theory of emotional contagion, if supported in the classroom, may also have important implications for instructional communication theory. It may be a more comprehensive theoretical explanation for many of the communication constructs that have been shown to be influential in the classroom such as nonverbal immediacy, motivation, affective learning and the relationships that exist between these variables. Although each of these variables has been shown to predict cognitive learning, we still do not have a widely accepted theory that explains *how* and *why* they work. Existing theoretical explanations include arousal-attention theory, motivation theory, and affective learning theory.

Arousal-attention theory. Kelley and Gorham (1988) explained the immediacy effect on cognitive learning using the arousal-attention theory. They argued that immediacy stimulates arousal in students and this aroused mental state focuses students' attention on the teacher and course content. Students who are not only mentally aroused, but also attending to the teacher and his/her message, are more likely to retain and recall

messages. They suggested that attention is not a sufficient condition for learning, however it remains a necessary or minimal condition for learning. Although their data were consistent with the theory, they did not test the arousal-attention theory. They simply used the theory as one way of explaining the results of their study.

Motivation theory. Christophel (1990), Richmond (1990), and Frymier (1994) tested the immediacy effect using motivation theory. This perspective sees students learning what they want to learn. Christophel, Richmond, and Frymier argued that state motivation levels, or motivation to learn in a specific class, of less motivated students can be increased when students are subjected to a teaching style that remains immediate. It is argued that an immediate teacher stimulates students to focus on instructional goals. The motivation explanation was empirically supported by Christophel and Frymier. The results from these studies suggested that the motivation variable accounted for more of the unique variance in learning measures than did nonverbal immediacy, however much of the predictable variance was a function of the two variables' co-linear relationship with learning.

Affective learning theory. Rodriguez, Plax, and Kearney (1996) challenged the motivation explanation of the immediacy effect offered above and argued that affective learning was a better explanation for cognitive learning. Rodriguez et al. argued that motivation to learn was captured by the more pervasive affective learning construct advanced by Krathwohl, Bloom, and Masia (1964). Rodriguez et al. argued that affective learning, which is stimulated via teacher communication variables such as immediacy, disclosure, and homophily, is an insufficient teaching goal. However, affect has been shown to influence students' time on task and ultimately cognitive learning. Rodriguez et

al. concluded that the affective learning explanation for the immediacy effect was a better explanation of cognitive learning than motivation because the affective learning model produced the least amount of error in the statistical model, and the model was more parsimonious and provided a better theoretical explanation.

Although each of these theoretical explanations remain valid and useful in our understanding of cognitive learning, we argue that the theory of emotional contagion may be a better theoretical explanation for *how* and *why* teacher and student communication processes interact in a transactional nature to influence learning.

Hypotheses and Research Question

In order to examine the three propositions of Hatfield, Cacioppo, and Rapson's (1992, 1994) theory of emotional contagion in the instructional context, the following hypotheses were posited:

H1: As students' perceptions of teachers' nonverbal immediacy increase so will their own self-reports of nonverbal responsiveness.

H2: As students' self-reports of nonverbal responsiveness increase so will their emotional response.

H3: Students' emotional response will be related to their teachers' perceived emotional response.

To provide additional support for Hatfield et al's (1992) second proposition, which states that students' emotional experiences in the classroom will be affected, moment to moment, by their mimicking their instructors' nonverbal behavior and/or by the feedback they receive from such mimicry, it is necessary to examine more closely the relationship between student nonverbal responsiveness and student emotional response. If

students' emotional response is positively related with *both* their own nonverbal responsiveness and their teachers' nonverbally immediate behavior, which variable accounts for the bulk of the variance? In order for the theory to be supported, the bulk of the variance should be attributed to the students' nonverbal responsiveness rather than the teachers' nonverbally immediate behavior. To determine this important theoretical relationship, the following research question was asked:

RQ 1: Which variable accounts for more of the variance in students' emotional response—teacher nonverbal immediacy or student nonverbal responsiveness?

Method

Sample

Participants were 465 (192 men, 268 women, 5 did not report) students enrolled in an introductory communication course at a university in the Southwest. The mean age was 20 (SD = 4.02). Participation in this study was voluntary and all volunteers received extra credit for their participation.

Procedure

Students were instructed to complete a questionnaire that dealt with the class and the instructor they had immediately preceding the class they were currently attending. The questionnaires included measures of teacher nonverbal immediacy, student nonverbal responsiveness, and self-report and perceived other-report measures of emotional response. Students completed the questionnaire during the eighth week of the semester.

Instruments

Richmond, Gorham, and McCroskey's (1987) Nonverbal Immediacy Behaviors (NIB) instrument was used to assess students' perceptions of their teachers' physical and psychological closeness by identifying such behaviors as eye contact, proximity, gestures, open-body position, and movement. This scale has an estimated reliability ranging from .73 to .89 with the lower estimates reflecting data obtained from teacher self-reports and the higher reliability reflecting students' reports of their teachers' immediacy. In this study, the mean, range, standard deviation, and coefficient alpha were $\underline{M} = 28.52$, Range = 8 – 40, $\underline{SD} = 6.66$, $\alpha = .82$.

Mottet's (2000) Student Nonverbal Responsiveness (SNR) measure was used to assess students' perceptions of their own nonverbal responsive behaviors in the classroom. This 17-item measure contains a variety of visual and audible nonverbal behaviors. Some of the items were patterned after Richmond et al's (1987) nonverbal immediacy behaviors instrument. Other responsive items that comprised this measure included audible nonverbal behaviors or vocalics such as vocal assurances, starters, inflections, tone, and pitch. Similar to the NIB measure, respondents were asked to indicate on a scale from zero to four how often they engaged in these nonverbal behaviors in the classroom with a zero indicating "never" and a four indicating "very often." The mean, range, standard deviation, and coefficient alpha for this scale were $\underline{M} = 36.75$, Range = 3 – 61, $\underline{SD} = 11.75$, $\alpha = .89$.

To measure emotional response, Mehrabian and Russell's (1974) three-factor model was used. This 18-item measure includes three sub-scales including Pleasure, Arousal, and Dominance. The items that comprise this measure are represented in Figure

1. Each sub-scale contains six sets of seven-step bi-polar scales. The Pleasure sub-scale included the following set of bi-polar adjectives: happy/unhappy, hopeful/unhopeful, joyful/miserable, comfortable/uncomfortable, pleased/annoyed, and satisfied/unsatisfied. The Arousal sub-scale included excited/calm, jittery/dull, aroused/un-aroused, stimulated/relaxed, frenzied/sluggish, and sleepy/wide awake. The Dominance sub-scale included bold/meek, assertive/unassertive, submissive/dominant, powerful/powerless, domineering/helpless, and decisive/in-decisive.

Insert Figure 1 about here

Because the Dominance factor remained problematic in prior classroom studies (Beebe & Biggers, 1986), the adjective pairs were slightly modified to fit the classroom context. For example, the adjective pair controlling-controlled was changed to powerful-powerless. All 18 items were then subjected to factor analysis. The factor loadings and the variance accounted for by each factor are represented in Table 1.

Table 1 about here

The revised Dominance factor emerged with a clean factor structure, although the Arousal factor contained two items (#9, #12) that failed to meet the 60 /40 criterion for factor loading. Both of these arousal items were retained since they did not detract from the sub-scale's internal reliability coefficient and since the items on their face value appeared to represent Arousal (#9, Arousal-Unaroused; #12, Wide Awake-Sleepy).

Because of its factor structure, three sub-scores were used to assess emotional response. Students completed this particular measure twice. At the beginning of the questionnaire, students completed the measure while perceiving their instructor's emotional response in the classroom. At the end of the questionnaire, students completed the same measure, but this time assessing their own emotional response. When completing the measure while assessing their instructors' emotional response, the means, standard deviations, and coefficient alphas were Pleasure ($\underline{M}$ = 32.26, $\underline{SD}$ = 6.78, α = .87), Arousal ($\underline{M}$ = 26.67, $\underline{SD}$ = 6.33, α = .76), and Dominance ($\underline{M}$ = 32.32, $\underline{SD}$ = 6.08, α = .86). While assessing their own emotional response, the means, standard deviations, and coefficient alphas were Pleasure ($\underline{M}$ = 28.78, $\underline{SD}$ = 8.14, α = .92), Arousal ($\underline{M}$ = 21.53, $\underline{SD}$ = 7.20, α = .83), and Dominance ($\underline{M}$ = 25.22, $\underline{SD}$ = 6.88, α = .89).

Results

The three hypotheses were tested using one-tailed Pearson correlations. The first hypothesis predicted that as students' perceptions of teachers' nonverbal immediacy increase, so will their own self-reports of nonverbal responsiveness. This hypothesis was supported with a correlation of .48 ($\underline{p} < .000$). As students' perceptions of their instructors' nonverbal immediacy increase, so do their own self-reports of being nonverbally responsive in the classroom.

The second hypothesis predicted that as students' self-reports of nonverbal responsiveness increase, so will their emotional response. This hypothesis was supported with a correlation of .53 ($\underline{p} < .000$) for Pleasure, .54 ($\underline{p} < .000$) for Arousal, and .50 ($\underline{p} < .000$) for Dominance. As students become more nonverbally responsive in the classroom,

they also become more emotionally responsive in terms of feeling more pleasure, arousal, and dominance.

The third hypothesis predicted that students' emotional response will be related to their perceptions of their instructors' emotional response. This hypothesis was supported. Instructor pleasure was correlated with student pleasure ($r = .60$, $p < .000$), instructor arousal was correlated with student arousal ($r = .32$, $p < .000$), and instructor dominance was correlated with student dominance ($r = .12$, $p < .01$). As teachers' emotional response in the classroom increases, so do their students' emotional response.

The research question asked which variable accounted for more of the variance in students' emotional response—teacher nonverbal immediacy or student nonverbal responsiveness. For the theory of emotional contagion to be supported, students' nonverbal responsiveness should account for more of the unique variance since the theory predicts that students' emotional experiences will be affected more by the activation and/or feedback from their actively mimicking their instructors' nonverbal behavior rather than passively observing their instructors' nonverbal behavior.

To answer this research question, a regression analysis was computed with teacher nonverbal immediacy and student nonverbal responsiveness serving as predictor variables and student emotional response (pleasure, arousal, dominance) serving as the criterion variable. The equation containing the predictor variables accounted for .36 of the variance in student pleasure, $F (2, 461) = 129.65$, $p < .000$, adjusted $R^2 = .36$, .31 of the variance in student arousal, $F (2, 461) = 104.63$, $p < .000$, adjusted $R^2 = .31$, and .27 of the variance in student dominance, $F (2, 460) = 82.72$, $p < .000$, adjusted $R^2 = .26$. The unique and co-linear predictive values are represented in Table 2.

Table 2 about here

The data yielded from the decomposed correlations suggest that although instructor nonverbal immediacy and student nonverbal responsiveness share variance with the three individual factors of emotional response, student nonverbal responsiveness remains the stronger predictor of student pleasure, arousal, and dominance, which is what the theory of emotional contagion predicts.

A follow-up test was conducted to examine the effect of student sex on the hypothesized relationships and variable means. The three hypothesized relationships were re-examined using partial correlations controlling for student sex. Student sex had minimal effect on the size of the correlations in each of the hypothesized relationships. The controlled and uncontrolled correlations and variance accounted for are represented in Table 3.

Table 3 about here

Even though student sex did not affect the relative rank order of the two variables correlated in any meaningful way, tests of significant difference were computed on each of the individual variables to determine if student sex had an effect on mean values. These tests yielded significant mean differences for three of the eight variables with women perceiving more teacher nonverbal immediacy, dominance, and pleasure than

men. Means, standard deviations, t-values, and significance levels are represented in Table 4.

Table 4 about here

These follow-up analyses were completed for two reasons. First, the sample included more females (N = 268) than males (N = 192) and second, there are known differences between males and females in the recognition and reporting of emotions (Booth-Butterfield & Booth-Butterfield, 1998; Hatfield et al., 1994; Planalp, 1999).

Discussion

The purpose of this study was to examine the theory of emotional contagion in the instructional context. This theory suggests that in conversations, people tend to automatically mimic the communicative behavior of other people and that subjective emotional experiences are affected by the activation and/or feedback from such mimicry (Hatfield et al., 1994). The results from this study provided additional support for the theory and suggest that emotions *may* be contagious in the instructional context. We can draw three conclusions from this study. The first conclusion is that teacher nonverbal immediacy is related to student nonverbal responsiveness. In fact, 23% of the variance in student nonverbal responsiveness is attributable to teacher nonverbal immediacy. This finding lends support to Hatfield et al's (1994) claim that people have a tendency to mimic and synchronize their movements with the behaviors of others.

The second conclusion is that as students' nonverbal responsiveness in the classroom increases, so do their levels of feeling pleasure, arousal, and dominance.

Between 25% to 29% of the variance in students' emotional response was attributable to their being nonverbally responsive in the classroom. This finding again lends support to Hatfield et al's (1994) claim that subjective emotional experiences are affected, by the activation and/or feedback from mimicry.

To strengthen Hatfield et al's (1994) claim further, student nonverbal responsiveness, rather than instructor nonverbal immediacy, remains the stronger predictor of student emotional response suggesting that students' emotional response may be the result of their own nonverbal behavior rather than the nonverbal behavior of their instructor. Instead of instructors transmitting their emotions to students directly, students' feelings of pleasure, arousal, and dominance are stimulated by the feedback they receive from their own responsive behavior in the classroom.

The third conclusion is that students' emotional responses are positively related to the perceived emotional responses of their instructor. Up to 36% of the variance in students' emotional response is attributable to their instructors' perceived emotional response. Hatfield et al. (1994) argue that people's emotional experiences converge or are "caught" when people automatically mimic the communicative behavior of others and as a result of this mimicry, similar emotions are activated via the afferent feedback one receives from mimicking others.

Research also suggests that women tend to be better encoders and decoders of emotional information than men (Guerrero & Reiter, 1998). The data from this study support this finding, however the effect of student sex remained minimal. Student sex did not influence the three hypothesized relationships, even though there were some significant student sex differences when examining individual variables. Significant mean

differences appeared in three of the eight variables with women perceiving more teacher nonverbal immediacy, dominance, and pleasure than men. It appears that men and women self-report similar levels of nonverbal responsiveness and affective responses, however perceive nonverbal behavior and affective responses in others differently. Because student sex did not influence or alter the hypothesized relationships, it appears that student sex affected survey respondents consistently.

In discussing the conclusions of this study it is important to acknowledge two limitations. The first pertains to the "perceived" nature of the collected data. Asking subjects to self-report their affective state has been supported and widely adopted as a valid and reliable research methodology (McCroskey, 1984; Russell & Barrett, 1999). Asking survey respondents to assess the affective states of others remains less than ideal, but not entirely unheard of, especially in a new line of research.

The second limitation involves collecting data on related concepts from the same subjects at the same time. Critics argue that this type of data collection yields inflated correlations. McCroskey and Richmond (1992) argue that this criticism may be overstated. They discuss the results of a study conducted by Christophel (1990) that compared the correlations among interrelated concepts, but from data collected from subjects who were randomly assigned to one of two sets of scales. The conclusions from this study suggested that "previous research was most likely not contaminated to any significant degree by simultaneous completion of measures among interrelated concepts" (p. 112).

Because of these limitations, we can not interpret the findings as confirming the theory of emotional contagion, however we can suggest that the hypotheses examined in

this study lend support to the theory's three claims. Emotional contagion may allow researchers to more accurately explain *how* and *why* many of the instructional communication related variables influence students' perceived cognitive learning. It appears that human emotion remains central to nonverbal immediacy, motivation , and affective learning, all of which have been examined extensively. When discussing future directions for instructional communication research, McCroskey and Richmond (1992) suggested that researchers focus on locating or developing theories that can be used to "explain the effects we already have isolated and predict effects we have not yet studied" (p. 118). The theory of emotional contagion may remain more comprehensive and inclusive of the variables examined in the research literature and provide much needed explanations for variables that have been shown to influence student behaviors and learning.

References

Andersen, J. F. (1979). Teacher immediacy as a predictor of teaching effectiveness. In D. Nimmo (Ed.), Communication yearbook (pp. 543-559). New Brunswick, NJ: Transaction Books.

Andersen, P. A., & Guerrero, L. K. (1998). Handbook of communication and emotion: Research, theory, applications, and contexts. San Diego: Academic Press.

Aune, K. S., Buller, D. B., & Aune, R. K. (1996). Display rule development in romantic relationships: Emotion management and perceived appropriateness of emotions across relationship stages. Human Communication Research, 23, 115-145.

Beebe, S. A., & Biggers, T. (1986). The relationship of trait and state emotion: Emotional responses to "The Day After". World Communication Journal, 15.

Behnke, R. R., Sawyer, C. R., & King, P. E. (1994). Contagion theory and the communication of public speaking state anxiety. Communication Education, 43, 246-251.

Biggers, T., & Masterson, J. T. (1983). A reconceptualization of communication apprehension in terms of the emotion-eliciting qualities of communication situations. Communication, 12, 93-105.

Biggers, T., & Masterson, J. T. (1984). Communication apprehension as a personality trait: An emotional defense of a concept. Communication Monographs, 51. 381-390.

Biggers, T., & Rankis, O. (1983). Dominance-submissiveness as an affective response to situations and as a predictor of approach-avoidance. Social Behavior and Personality, 11, 61-69.

Booth-Butterfield, M., & Booth-Butterfield, S. (1998). Emotionality and affective orientation. In J. C. McCroskey, J. A. Daly, M. M. Martin, & M. J. Beatty (Eds.), Communication and personality: Trait perspectives (pp. 171-189). Cresskill, NJ: Hampton Press.

Bull, N. (1951). The attitude theory of emotion. Nervous and Mental Disease Monographs, 81, New York: Coolidge Foundation.

Burgoon, J. K., Stern, L. A., Dillman, L. (1995). Interpersonal adaptation: Dyadic interaction patterns. New York: Cambridge University Press.

Cacioppo, J. T., & Gardner, W. L. (1999). Emotion. Annual Review of Psychology, 50, 191-214.

Cappella, J. N. (1993). The facial feedback hypothesis in human interaction: Review and speculation. Journal of Language and Social Psychology, 12, 13-29.

Christ, W. G., & Biggers, T. (1984). An exploratory investigation into the relationship between television program preference and emotion-eliciting qualities: A new theoretical approach. Western Journal of Speech Communication, 48, 293-307.

Christophel, D. M. (1990). The relationships among teacher immediacy behaviors, student motivation, and learning. Communication Education, 37, 323-340.

Dillard, J. P. (1998). The role of affect in communication, biology, and social relationships. In P. A. Andersen & L. K. Guerrero (Eds.), Handbook of communication and emotion: Research, theory, applications, and contexts (pp. xvii-xxxii). New York: Academic Press

Dillard, J. P., Kinney, T. A., & Cruz, M. G. (1996). Influence, appraisals, and emotions in close relationships. Communication Monographs, 63, 105-130.

Duclos, S. E., Laird, J. D., Schneider, E., Sexter, M., Stern, L., Van Lighten, O. (1989). Emotion-specific effects of facial expressions and postures on emotional experience. Journal of Personality and Social Psychology, 57, 100-108.

Frymier, A. B. (1994). A model of immediacy in the classroom. Communication Quarterly, 42, 133-144.

Frymier, A. B., & Thompson, C. A. (1992). Perceived teacher affinity-seeking in relation to perceived teacher credibility. Communication Education, 41, 388-399.

Guerrero, L. K., Andersen, P. A., & Trost, M. R. (1998). Communication and emotion: Basic concepts and approaches. In P. A. Andersen & L. K. Guerrero (Eds.), Handbook of communication and emotion: Research, theory, applications, and contexts (pp. 3-27). New York: Academic Press.

Guerrero, L. K., & Reiter, R. L. (1998). Expressing emotion: Sex differences in social skills and communicative responses to anger, sadness, and jealousy. In D. L. Canary & K. Dindia (Eds.), Sex differences and similarities in communication (pp. 321-350). Mahwah, NJ: Lawrence Erlbaum Associates.

Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1992). Emotional contagion. In M. S. Clark (Ed.), Review of personality and social psychology: Vol. 14. Emotion and social behavior (pp. 151-177). Newbury Park, CA: Sage.

Hatfield, E., Cacioppo, J. T., & Rapson, R. L. (1994). Emotional contagion. New York, Cambridge University Press.

Hatfield, E., Hsee, C. K., Costello, J., Schalenhamp, M., & Denney, C. (1995). The impact of vocal feedback on emotional experience and expression. Journal of Social Behavior & Personality, 10, 293-312.

Kelley, D. H., & Gorham, J. (1988). Effects of immediacy on recall of information. Communication Education, 37, 198-207.

Krathwohl, D. R., Bloom, B. S., & Masia B. B. (1964). Taxonomy of educational objectives: Handbook II: Affective domain. New York: McKay.

Laird, J. D. (1974). Self-attribution of emotion: The effects of expressive behavior on the quality of emotional experience. Journal of Personality and Social Psychology, 29, 475-486.

Mayer, J. D. (1986). How mood influences cognition. In N. E. Sharkey (Ed.), Advances in cognitive science 1 (pp. 290-314). New York: Halsted Press.

McCroskey, J. C. (1984). Self-report measurement. In J. A. Daly & J. C. McCroskey (Eds.), Avoiding communication: Shyness, reticence, and communication apprehension (pp. 81-94). Beverly Hills: Sage Publications, Inc.

McCroskey, J. C., & McCroskey, L. L. (1986). The affinity-seeking of classroom teachers. Communication Research Reports, 3, 158-167.

McCroskey, J. C., & Richmond, V. P. (1992). Increasing teacher influence through immediacy. In V. P. Richmond & J. C. McCroskey (Eds.), Power in the classroom: Communication, control, and concern (pp. 101-119). Hillsdale, NJ: Erlbuam.

McHugo, G. J., Lanzetta, J. T., Sullivan, D. G., Masters, R. D., & Englis, B. G. (1985). Emotional reactions to a political leader's expressive displays. Journal of Personality and Social Psychology, 49, 1513-1529.

Mehrabian, A. (1971). Silent messages. Belmont, CA: Wadsworth.

Mehrabian, A. (1980). Basic dimensions for a general psychological theory: Implications for personality, social, environmental, and developmental studies. Cambridge, MA: Oelgeschlager, Gunn, & Hain Publishers.

Mehrabian, A. (1981). Silent messages: Implicit communication of emotions and attitudes. Belmont, CA: Wadsworth.

Mehrabian, A., & Russell, J. A. (1974). The basic emotional impact of environments. Perceptual and Motor Skills, 38, 283-301.

Mitchell, M. M. (2000). Able but not motivated? The relative effects of happy and sad mood on persuasive message processing. Communication Monographs, 67, 215-226.

Mottet, T. P. (2000). Interactive television instructors' perceptions of students' nonverbal responsiveness and their influence on distance teaching. Communication Education, 49, 146-164.

Planalp, S. (1998). Communicating emotion in everyday life: Cues, channels, and processes. In P. A. Andersen & L. K. Guerrero (Eds.), Handbook of communication and emotion: Research, theory, applications, and contexts (pp. 29-48). New York: Academic Press.

Planalp, S. (1999). Communicating emotion: Social, moral, and cultural processes. New York: Cambridge University Press.

Richmond, V. P. (1990). Communication in the classroom: Power and motivation. Communication Education, 39, 181-195.

Richmond, V. P., Gorham, J. S., & McCroskey, J.C. (1987). The relationship between selected immediacy behaviors and cognitive learning. Communication Yearbook, 10, 574-590.

Rodriguez, J. I., Plax, T. G., & Kearney, P. (1996). Clarifying the relationship between teacher nonverbal immediacy and student cognitive learning: Affective learning as the central causal mediator. Communication Education, 45, 293-305.

Russell, J. A., & Barrett, L. F. (1999). Core affect, prototypical emotional episodes, and other things called emotion: Dissecting the elephant. Journal of Personality and Social Psychology, 76, 805-819.

Russell, J. A., & Mehrabian, A. (1978). Approach-avoidance and affiliation as functions of the emotion-eliciting quality of an environment. Environment and Behavior, 10, 355-387.

Salovey, P. & Sluyter, D. J. (Eds.). (1997). Emotional development and emotional intelligence: Educational implications. New York: BasicBooks.

Siegman, A. W., Anderson, R. A., & Berger, T. (1990). The angry voice: Its effects on the experience of anger and cardiovascular reactivity. Psychosomatic Medicine, 52, 631-643.

Vinson, L., & Biggers, J. T. (1993). Emotional response as a predictor of compliance-gaining message selection. The Southern Communication Journal, 192-206.

Yook, E. L. & Albert, R. D. (1999). Perceptions of international teaching assistants: The interrelatedness of intercultural training, cognition, and emotion. Communication Education, 48, 1-17.

Footnotes

[1]Hatfield, Cacioppo, and Rapson (1994) also examined what they refer to as countercontagion. Rather than mimicking the other's behavior, countercontagion yields complementary behavior (i.e., as when a fist raised in anger causes a timid person to shrink back in fear). They cite studies examining the countercontagion effect, but conclude that "even in these instances there seems to be a commonality, an adhesive emotion, that binds two equally matched warriors whose movements are perfectly synchronized" (p. 24). They review another study that supports "primitive" emotional contagion even among adversaries (McHugo, Lanzetta, Sullivan, Masters, & Englis, 1985). This study examined friends and enemies of then-President Ronald Reagan. After watching video clips of a television broadcast featuring Reagan, friends and enemies reported having different emotional reactions, however "[w]hen we look at viewers' automatic reactions, we find that even the bitterest of enemies could not help but respond to the President's 'magic': Both supporters and critics mimicked Reagan's facial expressions, and an analysis of skin resistance levels showed that subjects were most relaxed during happiness/reassurance displays and least relaxed during anger/threat displays, regardless of their attitudes toward Reagan" (p. 26).

Figure 1

Emotional/Affective Response Measure

Instructions: Place an "X" on the blank closest to the word that best represents how you (or your instructor) was feeling. Please work quickly, there are no right and wrong answers.
In general, I (or my instructor) was feeling:

1. Happy	___	___	___	___	___	___	___	Unhappy
2. Hopeful	___	___	___	___	___	___	___	Un-Hopeful
3. Joyful	___	___	___	___	___	___	___	Miserable
4. Uncomfortable	___	___	___	___	___	___	___	Comfortable
5. Pleased	___	___	___	___	___	___	___	Annoyed
6. Unsatisfied	___	___	___	___	___	___	___	Satisfied
7. Excited	___	___	___	___	___	___	___	Calm
8. Jittery	___	___	___	___	___	___	___	Dull
9. Unaroused	___	___	___	___	___	___	___	Aroused
10. Stimulated	___	___	___	___	___	___	___	Relaxed
11. Frenzied	___	___	___	___	___	___	___	Sluggish
12. Wide Awake	___	___	___	___	___	___	___	Sleepy
13. Bold	___	___	___	___	___	___	___	Meek
14. Assertive	___	___	___	___	___	___	___	Not Assertive
15. Dominant	___	___	___	___	___	___	___	Submissive
16. Powerless	___	___	___	___	___	___	___	Powerful
17. Domineering	___	___	___	___	___	___	___	Helpless
18. Decisive	___	___	___	___	___	___	___	In-Decisive

Table 1
Rotated Factor Loadings of 18 Emotional Response Items

Item	Instructor Emotional Response Factor 1 [Pleasure]	Factor 2 [Arousal]	Factor 3 [Dominance]	Student Emotional Response Factor 1 [Pleasure]	Factor 2 [Arousal]	Factor 3 [Dominance]
1	.84			.81		
2	.73			.75		.33
3	.82			.85		
4	.65		.31	.68		
5	.75			.82		
6	.78			.82		
7		.70			.70	
8		.66			.63	
9	.45	.53		.41	.68	
10		.74			.75	
11		.64	.35	.30	.66	.30
12	.36	.33	.44	.30	.59	.31
13	.32		.67		.35	.69
14	.32		.69		.40	.70
15			.83			.81
16			.77			.75
17			.70			.74
18			.68	.35		.64
Variance	23.65	14.40	20.80	25.50	18.67	21.12

Table 2

Decomposition of Instructor Nonverbal Immediacy and Student Nonverbal Responsiveness Predictor Variables with Student Emotional Response

	Unique Variance Attributable to:			
	Instructor NVI	Student NVR	Colinear	Total Variance
Student Pleasure	.08	.11	.17	.36
Student Arousal	.02	.17	.12	.31
Student Dominance	.01	.16	.10	.27

Table 3

Partial Correlations Controlling for Student Sex

Hypothesized Relationship	Controlled for Sex		Not Controlled for Sex	
	r	r^2	r	r^2
H1: Teacher NVI-Student NVR	.483	.23	.482	.23
H2: S NVR-S Pleasure	.527	.27	.531	.28
H2: S NVR-S Arousal	.542	.29	.542	.29
H2: S NVR-S Dominance	.508	.25	.505	.25
H3: S Pleasure-T Pleasure	.593	.35	.595	.35
H3: S Arousal-T Arousal	.334	.11	.324	.10
H3: S Dominance-T Dominance	.121	.01	.118	.01

Note: All 1-tailed correlations significant at the 0.01 level; NVI=Nonverbal Immediacy; NVR=Nonverbal Responsiveness; S=Student, T=Teacher

Table 4

Tests of Significant Difference for Student Sex

Variables	MALES Means	MALES SD	FEMALES Means	FEMALES SD	t-Value	Sig.
T NVI	27.01	6.47	26.60	6.59	-4.19	.000
S NVR	35.72	11.90	37.58	11.63	-1.67	.095
T Pleasure	31.20	6.57	32.98	6.81	-2.81	.005
T Arousal	26.34	6.02	26.82	6.49	-.81	.420
T Dominance	31.35	5.94	33.00	6.07	-2.89	.004
S Pleasure	27.89	8.00	29.27	8.37	-1.77	.077
S Arousal	21.45	6.82	21.56	7.49	-.16	.873
S Dominance	25.35	7.25	25.09	6.65	.40	.692